

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT



To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/JP2004/008934

International filing date (day/month/year)
18.06.2004

Priority date (day/month/year)
19.06.2003

International Patent Classification (IPC) or both national classification and IPC
C07D405/14

Applicant
SUMITOMO CHEMICAL COMPANY, LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITYInternational application No.
PCT/JP2004/008934

IAP20 Rec'd PCT/PTO 16 DEC 2005

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2004/008934

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-7
	No: Claims	
Inventive step (IS)	Yes: Claims	1-7
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-7
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item V.

1 The following documents are referred to in this communication:

- D1 : GB 2 338 240 A (MERCK PATENT GMBH) 15 December 1999 (1999-12-15)
D2 : US 5 851 427 A (KELLY STEPHEN) 22 December 1998 (1998-12-22)
D3 : US 5 904 984 A (SU WEI-FANG A ET AL) 18 May 1999 (1999-05-18)
D4 : US 5 569 727 A (MORMANN WERNER ET AL) 29 October 1996 (1996-10-29)
D5: BARASKOV N. ET AL.: "Design of New Polymers to Improve Radiation Stability of Plastic Scintillators" PROCEEDINGS OF THE FOURTH INTERNATIONAL CONFERENCE ON CALORIMETRY IN HIGH ENERGY PHYSICS, 1993, pages 542-551, XP009037802 SINGAPORE

Novelty

The compounds of the present claims are a novel selection from those of claim 4 of D1.

Thus a selection has been made from the following moieties in the D1 compounds:

- a) Sp-X
- b) rings a and B have been selected as a 1,4-phenylene group (cf application: Ar¹ and Ar²)
- c) Z¹ and Z² are selected as -OCH₂- and -CH₂O- respectively and ring C has been selected as being a 1,4-phenylene group (cf application: Y¹ and Y² are O and Z is (Z-7)).

The compounds of the present application differ from those of D2 through the meaning of the Z group, which does not include naphthalene.

The compounds of the present claims differ from the compounds of D3 either through the presence of the Z group (cf claim 1 R is (o)) or through the meanings of Y¹ and Y² (cf claim 1 R is (l)) or through the presence of Ar¹ and Ar² (cf claim 1, R is (a)).

The compounds of the present claims differ from those of D4 through the meanings of Y¹ and Y² (cf claim 1 of D1).

**WRITTEN OPINION OF THE
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AUTHORITY (SEPARATE SHEET)**

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The claimed compounds differ from those of D5 through the fact that Z is a 1,3-phenylene group rather than a 1,3-phenylene group.

Inventive Step

The closest prior art is considered to be D1, since the compounds of the present application are a selection from the disclosures of D1 and in that they are also useful as liquid crystals.

In view of the above the skilled person would have readily arrived qualitatively at the claimed subject matter.

The problem underlying the invention is considered to be the provision of compounds having surprising effects compared to the structurally closest compounds of the prior art.

In the case where comparative tests are envisaged in order to support an inventive step, these must be carried out between the compounds of the present application having the maximum structural similarity with the compounds of the closest prior art, such that the effect is shown to have its origins in the distinguishing feature of the invention.

The Application contains comparative experiments (see comparative examples). However the comparative compound used is not considered to be the structurally closest prior art compound. Moreover, there are compounds claimed, which are structurally closer to the comparative compound. At present the comparative tests do not show that an improved effect lies in the distinguishing feature of the invention nor are they representative for the whole scope claimed.

re item VII

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 to D5 is not mentioned in the description, nor are these documents identified therein.